

# Energy Action Plan Pillar 3: Energy Water Linkages

## Phase 1: Conclusion

Energy Sector Coordinating Committee (ESCC)  
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# Why energy-water linkages?

- **Strengthen the knowledge base to:**
  - Understand inter-relationships and dependencies
  - Explore tradeoffs
  - Cope with exogenous pressures (climate change, population growth)
  
- **To support decisions on:**
  1. **Allocation and regulation** → infrastructure decisions e.g., SYNAS<sub>2</sub>
  2. **Operational issues** → management decisions e.g., disaster risk mgmt
  3. **Basin perspectives** → long term planning, understanding linkages e.g., framework agreement

Sept 2009 – Mar 2010  
Sept. 2010  
March 2011

**Energy Action Plan  
Energy-Water Workshop**

**Phase 1A: Analytical and Modeling  
Architecture**

**Phase 1B:  
“First Generation” Demonstration  
Model**

Regional scoping & reconnaissance

National consultations with energy  
water experts

Model inventory and detailed review

Partner Activities: SDC,  
UNECE, USAID , GIZ

Demonstrate “First Generation” Geospatial  
Model

July 4-6  
2012

**Framework for CA Energy-Water Decision Support System – A  
Road Map Forward**

**Phase 2: Implement Recommendations**

# Phase 1A: Priorities and Needs



## *National energy water counterparts:*

- A better understanding of energy water dynamics is needed
- Many concerns about transparency, quality and access to information
- Today's energy-water economics call for different approach
- There are common analytical needs (e.g., variables, sectors) across countries
- Need to bring different sectors together even within a country
- Direct national engagement is critical – analysis must capture sovereign priorities



## *Regional institutions:*

- Agreed -upon tools for regional analysis are not available
- Useful to bring together national experts in a regional team
- Need to build capacity in existing and new analytical tools
- Engage Afghanistan



## *International modeling community:*

- Take advantage of significant recent innovations in modeling and data access
- Link the analyst and decision-maker (simulations, visual presentations)
- Inclusive process is important in developing, calibrating and quality assuring the model/analysis
- Multi-sectoral approach critical to understand trade-offs and synergies
- Uncertainty will play and even larger role in managing water and energy



# Phase 1B: “First Generation” Demonstration Model

## *Output:*

A basic basin model using readily available geospatial data and modeling platforms

## *Features:*

- Information framework which integrates sectors and resources across the region
- Visual presentations to illustrate time periods and geospatial distributions
- Set of international data to augment/verify local data
- Publically available earth system modeling platform
- Potential to simulate impacts of climate change, water productivity and water management

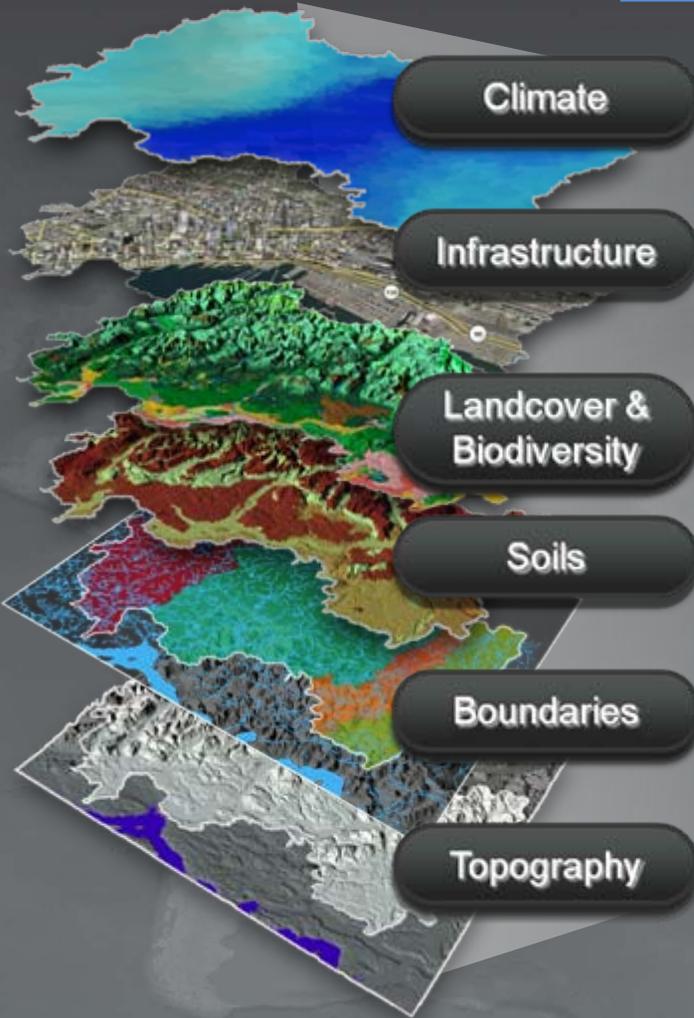
## *Next steps:*

- This is not a completed management model – needs to link with country priorities (Phase 1A)

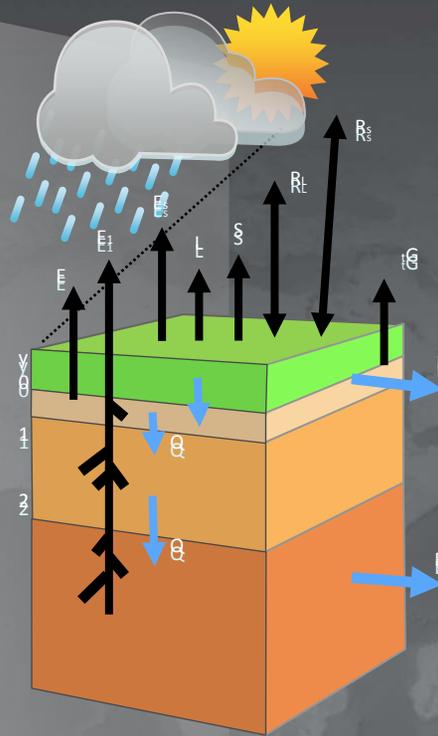
# Earth System Modeling

The core of these models are “geospatially-explicit, process-based, & coupled

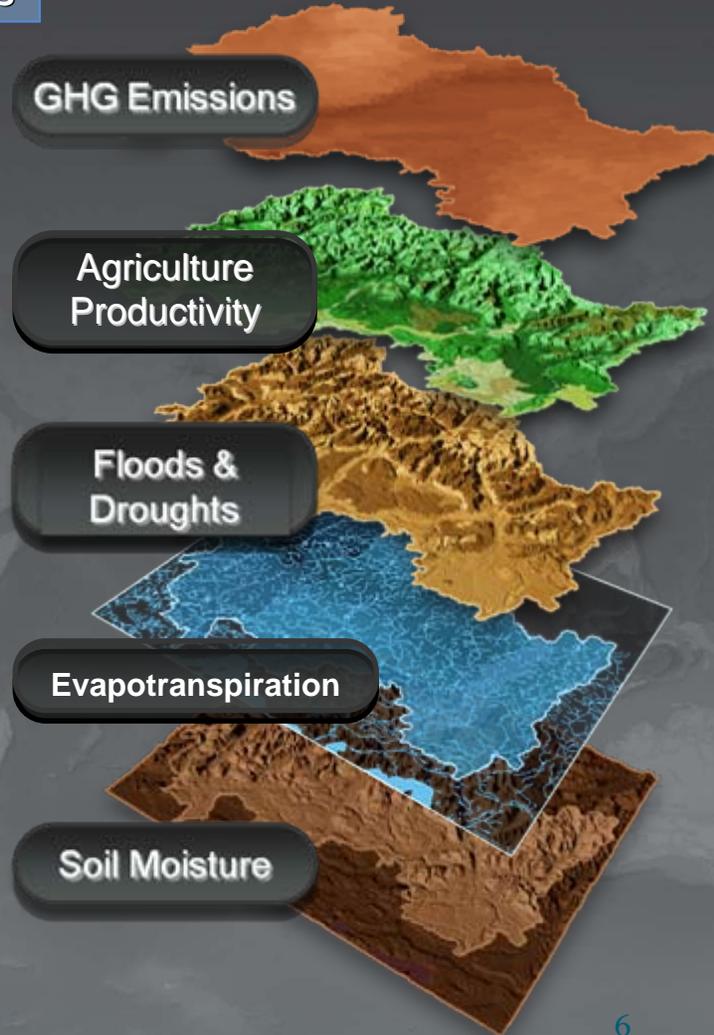
## THE DATA MODULES



## COMPUTATION-ENGINE THE MODELS AND CALCULATIONS



## THE OUTPUT VARIABLES



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October 2011

# Baseline circumstances

- Energy-water decision support is currently characterized by:
  - Simple optimization → hydropower as residual
  - Little or no integration of economic principles
  - Poor quality and distrusted data
  - Outdated approaches → lack of flexibility and transparency
  - Focus on basin-level allocation versus operational needs
  - Uneven playing field
  - Analytical hegemon → dominance of SIC-ICWC
  - Disconnect between technical and policy perspectives
  - Rogun impact on dialogue and cooperation

# Technical workshop (July 4-6 2012) Almaty, Kazakhstan

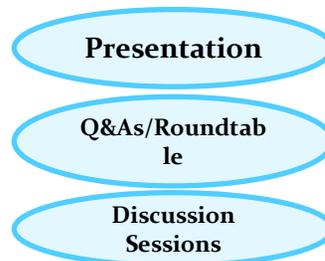
## Strengthening Analysis for Integrated Water Resources Management

6 countries: KAZ, UZB, TAJ, AFG, KYG, TURK  
37 delegates  
plus 30+ international consultants and development partners

**TO:** Outline opportunities and priorities for strengthening analysis in the six countries of the Aral Sea Basin and within regional institutions of Central Asia

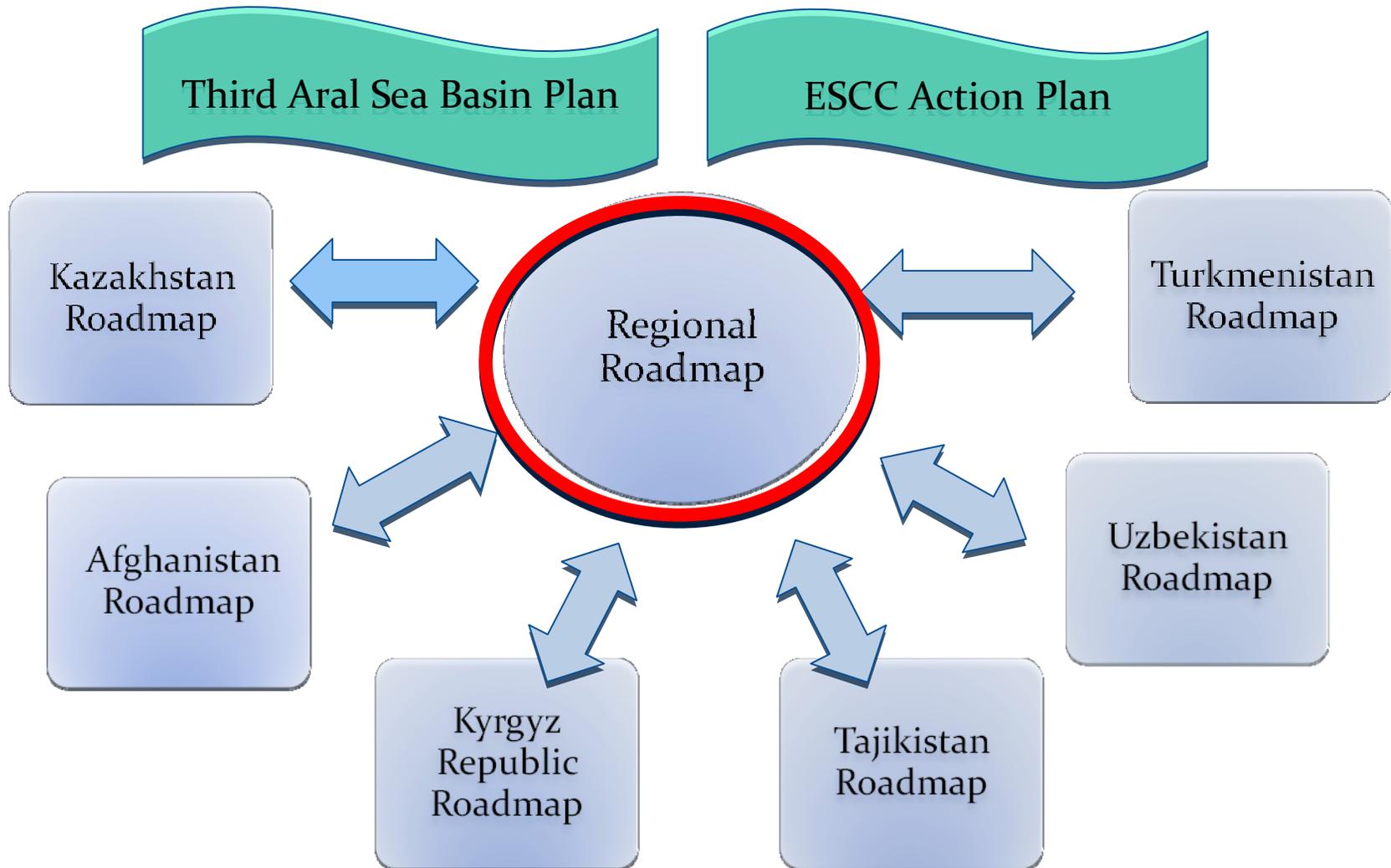
**BY:** Exploring current approaches and emerging analytical tools to strengthen decision support systems for integrated water resource management

•**Day 1:** Data  
•**Day 2:** Modeling and Capacity Development  
•**Day 2:** Evening National discussions  
•**Day 3:** Future Work Program: The Road Map



**Work Program = A list of actions, initiatives, investments to strengthen analysis of integrated water resources**

# Proposed Roadmap



# Eight Principles

## Cooperation

- Balance of regional and national ownership (including Afghanistan)
- Emphasis on national and regional consultation

## Knowledge outputs

- Basin modeling addresses regional and national priorities and constraints
- Presentation of information in user-friendly accessible formats

## Open source

- Emphasis on open source data, information products and models placed in the public domain
- “Top down” and “bottom up” data are appropriately integrated

## Capacity & Institutions

- Existing human and technical resources combine with emerging technology
- Institutional and financial sustainability

## DATA

- Complete inventory of data sources (metadata , “bottom-up” and “top-down”)
- Develop platforms to access public domain information/ knowledge products ensuring:
  - comparability of data and interoperability of systems
  - integration of “bottom-up” and “top-down” data
- Establish principles and binding agreements on data exchange/ public-domain access
- Develop and disseminate user-friendly information products (e.g., UNRCCA)

## MODELS

- Explore/evaluate a system of models for basin-wide planning
- Establish analytical tools for real-time operations (e.g. water quality, disaster-risk, salinity, water conservation climate change)
- Design/Upgrade & link model(s), reflecting regional/national perspectives
- Develop enhanced visualization and communication of modeling results

## CAPACITY DEVELOPMENT

- Build professional networks (e.g. academia, community of practice) and organize professional forums/exchanges and establish technical working groups
- Undertake training/workshop series on priority topics (e.g. new “top-down” and “bottom-up” technologies)
- Engage policy-level decision makers
- Enhance institutional office infrastructure and communication as needed (e.g. satellite data download)

## GOVERNANCE

- Integrate with existing organizations and associated reforms
- Undertake steps for sustainability (incl. staffing, skills, financial sustainability)
- Create institutional framework for maintenance
- Maximize use of open systems

# Next steps

- Draft workshop report for comment
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- Early activities initiated
- Refine and roadmap to a work program
- National discussions on proposed roadmap
- Consolidated Basin-level work program prepared for endorsement



Thank you